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WASHINGTON, D.C.
AUSTIN, TEXAS

October 8, 2003

VIA E-MAIL AND FEDERAL EXPRESS

California Energy Commission
Attn: Bryan Alcorn, Dk. No. 03-BSTD-1
1516 Ninth Street, Mail Station 4
Sacramento, CA 95814

Re: Cardinal Glass Industries Comments on 45 Day Language, and in Response to HCD's Public Comments on the Proposed Fenestration Requirements for Existing Homes

Dear Mr. Alcorn:

Enclosed with this letter are the comments of Cardinal Glass Industries in support of the Commission's 2005 Express Terms – 45 Day Language, and in response to the Department of Housing and Community Development's public comments on the proposed fenestration requirements for existing homes.

Thank you for this opportunity to provide comments. If you have any questions, please contact me.

Sincerely,

Eric M. DeVito
Counsel for Cardinal Glass Industries

Enclosure

cc: Commissioner Robert Pernell (w/ encl.)
Commissioner Art Rosenfeld (w/ encl.)
Bill Pennington (w/ encl.)

Comments of Cardinal Glass Industries in Support of the Commission's 2005 Express Terms – 45 Day Language

and

In Response to the Department of Housing and Community Development's Public Comments on the Proposed Fenestration Requirements for Existing Homes

Cardinal Glass Industries submits the following comments in support of the Commission's 2005 Building Energy Efficiency Standards Express Terms - 45 Day Language, and in particular, we support the new and improved requirements for fenestration in existing homes. We also have reviewed the public comments submitted by the Department of Housing and Community Development ("HCD"), specifically, their Comments and Recommendations 5, 9 and 11 in opposition to the Commission's proposed changes to the additions, alterations and replacement window requirements for the 2005 Standards. In these comments, we provide specific responses refuting HCD's recommendations.

Introduction

Cardinal is the nation's largest manufacturer of energy efficient glazing for fenestration (i.e., insulated glass units with low-e coatings). With substantial manufacturing facilities in California, we have a considerable stake in the success of the state in managing its energy usage, both as a producer of energy efficient products and as an energy consumer. We have played an active role in past Standards revision proceedings and in the current proceeding.

While we believe that the Commission made substantial improvements during the AB 970 process, we think that a number of potential improvements still remain "on the table." In particular, the fenestration requirements for existing homes in the current California energy code are not nearly equivalent in stringency or effectiveness when compared to the requirements for new homes. The 2005 Express Terms, if adopted, will effectively implement cost-effective energy and peak demand saving measures for fenestration products in existing homes, which are entirely consistent with the current Title 24 requirements for new homes. We strongly support the efforts of the Commission Staff in implementing the Commission's Order on AB 970, where the Commission specifically requested that efficiency measures for windows in existing homes

be included in the next update. We respectfully urge the Commission to approve the 2005 Express Terms and the improved requirements for fenestration in existing homes in compliance with the Commission's earlier AB 970 mandate.

I. Proposed Fenestration Performance Requirements for Windows in Existing Homes Provide New, Cost-Effective Energy and Demand Savings for California

A. Setting Maximum Fenestration Performance Criteria for Windows in Existing Homes is Cost-Effective and Would Double the Window-Related Savings in California

The Title 24 maximum fenestration U-factor and SHGC prescriptive values for new homes have been in place in California for a number of years and are an integral part of the current Title 24 Standards. These prescriptive performance values have been determined to cost-effectively save energy and peak electric demand time and time again during each upgrade cycle to the Title 24 Standards. Most notably, the maximum 0.40 SHGC requirement in climate zones with significant cooling requirements saves over 1,000 kWh and ½ to 1 kW per average new home. The 0.40 SHGC requirement is expected to be shown to be even more cost-effective using the new TDV performance valuation to be adopted in the 2005 Standards because of the true value associated with reduced cooling energy use at peak times. The same magnitude of savings has been calculated for existing homes.[1]

A significant shortcoming of the current Title 24 Standards is that they do not effectively implement meaningful fenestration U-factor or SHGC criteria for existing homes to deliver these highly achievable energy or peak demand savings. Half the windows sold in California are for existing homes. Even assuming full compliance in all new homes, the best Californians would achieve is half the potential energy and demand savings associated with high performance windows. Requiring existing homes to meet the new home prescriptive requirements would

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[1] It is important to note that the cost to improve window glazing for existing homes to the point it can achieve code level of performance is very minor when compared to the total cost of a replacement window project. This is because in most replacement window projects, the cost to install each window is a large portion of the total project cost. In many instances, the cost to install the window is as much or more than the window itself. A $15 upgrade charge to improve the glazing package in a replacement window product is a very minor piece of the total project and is "money well spent."

provide immediate energy and peak demand savings (double the current achievable savings) for California that have been "left on the table" until now.

B. The Express Terms Correctly Apply the Package D Requirements for New Homes to Existing Homes

The "formula" for achieving a high performance window capable of meeting the energy code requirements is quite standard: a double-glazed unit in various frame types, a standard spacer, and a low-E coating to create all types of residential products. The same technology is used to create windows in new or existing homes. In many cases, the same exact window product could be installed as a new window or as a replacement window. Almost every double-pane window manufactured today can be made with low-E glazing that can meet the Package D U-factor and SHGC requirements. For technical reasons, it makes perfect sense to require all windows, whether used in new or existing homes, to meet the same energy requirements.

For other, non-technical reasons, it also makes perfect sense to implement the same requirements for windows in new and existing homes:

- *Economies of Scale*: Window manufacturers will be able to inventory the same glass and/or IG units for their new and replacement lines. This leads to economies of scale and ultimately, lower consumer costs.

- *Implementation and Enforcement*: With one set of requirements, manufacturers will ensure that every product meets the code requirements before they ever leave the plant. The greatest implementation and enforcement occurs when the only products manufactured already meet the code.

The Commission also should note that requirements for windows in existing homes, including replacements, have existed in the national model code – the International Energy Conservation Code for a number of years. Since its 1998 version, the IECC has had consistent requirements for windows in new and existing homes (including additions, alterations and replacement windows). The proposed CA requirements are also largely consistent with these IECC requirements.

C. Effective Requirements for Windows in Existing Homes Meet the Stated Goal of the 2005 Standards Upgrade: Adopt Measures that Save Energy at Peak Times

The Policy Statement Overview of the Notice of Proposed Action for the 2005 update states:

> The Standards proceeding also is pursuing major objectives of the Commission, **including the adaptation of the Standards to emphasize energy efficiency measures that save energy at peak periods and seasons**. . . .

Most notably, under the Express Terms, the 0.40 SHGC Requirement currently in place for new homes would be applicable to all windows in existing homes (additions, alterations and replacements). The primary purpose of this requirement is to reduce electric air conditioning loads by blocking unwanted heat gain and create increased occupant comfort at higher indoor temperatures. Obviously, preventing the sun's heat from entering the home as unwanted cooling load will have a significant impact on electric use during the hottest hours of the day, which drives utility peaks. Comfort also plays a key role. Comfortable homeowners will be far less likely to adjust their thermostats lower to use more cooling energy at peak times. Adopting the new home U-factor and SHGC maximums for windows in existing homes clearly meets the Commission's goal of implementing new requirements capable of reducing peak electricity use.

II. Comments Refuting HCD Public Comments and Recommendations 5, 9 and 11

In a September 23, 2003 letter to the Commission, HCD provided a number of negative comments and recommendations challenging many of the new energy code requirements in the 2005 update. Because our expertise is with regard to energy efficient windows, we are providing targeted responses to HCD's challenges that relate specifically to the proposed window upgrades.

- HCD Comment and Recommendation 5 (excerpt): "The proposed standard requires the U-factors in Package D be updated to match the new National Fenestration Rating Council's test procedures. HCD recognizes this new energy feature as adding a considerable negative impact to the affordability of housing maintenance throughout the state."

HCD must not fully understand why the U-factors are being revised in this standards upgrade. The revised U-factors are intended to reflect the change in U-factors resulting from following new NFRC procedures (NFRC 100-2001). In other words, the new procedures result in different U-factors for the same product compared with U-factors determined under the old NFRC procedures. These new results need to be incorporated into the energy code. The new U-factors do not represent U-factor changes resulting from product changes; they do not represent any increased (or decreased) stringency. Products that could meet the old Package D requirements under old NFRC procedures will meet the revised Package D requirements under new NFRC procedures. Revising the U-factors as proposed in the 2005 upgrade will merely ensure that the new code is equal in stringency to the current code. (If U-factors were not revised to match the new NFRC procedures, the new code would be **less** stringent.) As a result, the requirements have no impact on affordability, either positive or negative, but merely maintain the status quo.

- HCD Comment and Recommendation 9 (excerpt): ". . . the new window requirements will increase the costs to the consumer by approximately $50.00 or more per window when upgrading from a dual pane window to a window with dual pane low-E glazing." (sic)

The claimed $50 upgrade charge is not accurate. For the upgrade cost to reach $50, it includes a combination of factors: better quality product, different frame types, etc. The true upgrade cost of the proposed window requirements must be assessed strictly on the glazing upgrade itself. It should not include the cost of different framing materials because low-E glazing can be added to virtually any double-pane window, including aluminum frames, and it will meet the requirements in the 2005 upgrade.

As was explained in their comments, HCD's upgrade analysis involved looking through the product options available at a big box retailer, like Lowe's or Home Depot. Without proper explanation, the results of such an analysis can be misleading. For example, the marketing approach at these stores involves "good, better, best" options in any given product category, like windows. In some stores, the "good" product line may not have a low-E glass upgrade option currently, which means a consumer would have to upgrade to the "better" product to get code compliant low-E glazing. It appears that HCD adopted this type of analysis approach. This type of approach, when properly understood, actually highlights the appeal of the 2005 upgrade.

Under the new standards, every window must meet the fenestration energy efficiency requirements, which means every window, from "good to best" must be code compliant. If the "good" product is already a double pane product, which is likely because double pane windows dominate in California, then low-E glazing most likely can be added to it with little additional cost beyond the upgrade cost of the low-E itself. The wholesale cost of the coated product to window manufacturers ranges anywhere from $0.30 to $0.50 per sq.ft., which translates into an end cost to consumers that ranges from $0.90 to $1.50 per sq.ft. (An analysis of the Home Depot products that currently offer both low-E and non-low-E glass options substantiates this price range.) Assuming a standard, 15 square foot window product, the true upgrade cost to consider is closer to $15 per window, not $50. Moreover, this cost is before economies of scale potentially reduce the upgrade cost further.

It is also important to reiterate (see above comments) that the same window requirements for new homes that are to be implemented for existing homes has been found cost-effective time and again in California. In other words, the $15 per window is "money well spent."

- HCD Comment and Recommendation 9 (excerpt): "HCD is also concerned over the issue of a dwelling unit owner having to install a window that will not correspond to the existing windows in the structure."

- HCD Comment and Recommendation 11 (excerpt): "If further study is rejected and the commission proceeds with adopting of this building standard, HCD recommends this proposed standard be amended and include the current Note contained § 152(b)(2)(B) which allows the replacement of like materials for fenestration repair or replacement."

Both of these comments warrant the same response. Low solar gain low-E can be added to virtually any double-pane window manufactured today. If a homeowner can buy a window to match his current windows, assuming it is not a single pane product, chances are, low-E glazing that would meet the Package D requirements can be added to it. A bigger concern to homeowners is whether their window type is still manufactured. If not, any new window, regardless of the energy requirements, will have difficulty matching the existing windows. If a homeowner is forced to retain the existing frame appearance, they might be forced to replace only the glass portion, which would be considered a repair. Repairs are exempt from the standard, so the HCD's negative comment is not applicable in such a situation.

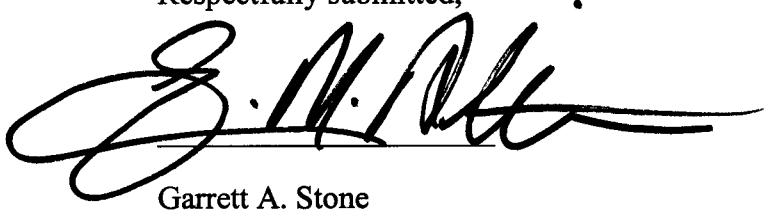
We also caution the Commission to not "throw the baby out with the bathwater." The vast majority of window replacements in the state are garden-variety window replacements where low-E glazing is already an option. The new Title 24 existing home requirements will cause streamlined inventories and economies of scale because the low-E product line will become the stocked item. Retracting the Title 24 upgrades for windows in existing homes or watering down the requirements by adding unwarranted exemptions will simply throw away significant energy and peak savings to appease a very minor segment of the replacement market.

Conclusion

With one set of simple, concise, set of requirements for all homes – specifically, requiring the Package D maximum U-factors and SHGCs for all fenestration installed in California – the Commission can ensure that cost-effective, readily available technology is being utilized to capture the maximum reasonable electric peak reduction benefits in new and existing California buildings.

Based on the reasons set forth above, Cardinal urges the Commission to adopt the proposed revisions to Title 24 as enumerated in the Express Terms – 45 Day Language.

Respectfully submitted,



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